

IN THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF THE CLAIMS:

Claims:

1. (Currently amended) A catheter for aspiration, fragmentation and removal of removable material from hollow bodies, in particular of thrombi and emboli from blood vessels, the catheter comprising:

a working head that is axially displaceable over a guide wire, is displaceable independently of the guide wire, is arranged at a distal end of the catheters, and has at least one lateral opening;

a flexible transport screw that has a distal and a proximal part and is capable of being rotated by means of a rotary drive of a drive unit, the rotary drive being a distance away from the working head;

a flexible tube surrounding the transport screw, connected to the working head and intended for removing the removable material or detached thrombi and emboli fragments
wherein the flexible tube comprises a proximal part, the proximal part having a proximal end and a distal end, the proximal end comprising a plastic tube and the distal end comprising a metallic helical spring surrounded by a thin-walled elastic plastic sheath; and

a cutting tool[[;]].

wherein the transport screw forms a shearing cutting tool in cooperation cooperates with the lateral opening of the working head for shearing and comminuting materials or aspirated and/or detached thrombi and emboli penetrating between peripheral borders of the transport screw.

2. (Currently amended) A catheter for aspiration, fragmentation and removal of removable material from hollow bodies, in particular of thrombi and emboli from blood vessels, the catheter comprising:

a distal and a proximal end;

a working head that is axially displaceable over a guide wire independently thereof, is arranged at the distal end of the catheter, and has at least one lateral opening;

a flexible transport screw that has a distal and a proximal part, extends from the proximal to the distal end of the catheter, and is capable of being rotated by means of a rotary drive of a drive unit, the rotary drive being a distance away from the working head, and the transport screw being provided with transport surfaces that extend helically along a longitudinal axis of the transport screw and in a direction of radii of the transport screw;

a flexible tube surrounding the transport screw, connected to the working head and intended for removing the removable material or detached thrombi and emboli fragments
wherein the flexible tube comprises a proximal part, the proximal part having a proximal end and a distal end, the proximal end comprising a plastic tube and the distal end comprising a metallic helical spring surrounded by a thin-walled elastic plastic sheath, and

a cutting tool[[;]],

wherein the transport screw ~~forms~~, in the region of the working head, cooperates with a ~~shearing~~ the cutting tool ~~in cooperation with~~ and the lateral opening of the working head, ~~and~~ wherein the cutting tool, in an operating state, to shear, continuously comminute[[s]] the material or aspirated and/or detached thrombi and emboli penetrating between peripheral borders of the transport screw and borders of the lateral openings and remove[[s]] them along the transport surface in a direction of the proximal end.

3. (Currently amended) A working head on a catheter for aspiration, fragmentation and removal of removable material from hollow bodies, in particular of thrombi and emboli from blood vessels, the working head comprising:

at least one lateral opening;

wherein the catheter comprises:

a flexible transport screw that has a distal and a proximal part and can be rotated by means of a rotary drive of a drive unit, the rotary drive being a distance away from the working head, and the transport screw being provided with transport surfaces;

a flexible tube surrounding the transport screw, connected to the working head and intended for removing the removable material or detached thrombi and emboli fragments
wherein the flexible tube comprises a proximal part, the proximal part having a proximal end and a distal end, the proximal end comprising a plastic tube and the distal end comprising a metallic

helical spring surrounded by a thin-walled elastic plastic sheath; and

a cutting tool, wherein the transport screw ~~e~~comprises, in a region of the working head, ~~a shearing~~ ~~cooperates with the cutting tool that cooperates with~~ ~~and~~ the opening of the working head and, in an operating state, ~~to shear~~ continuously comminute~~[[s]]~~ the materials or aspirated and/or detached thrombi and emboli penetrating between peripheral borders of the transport screw and borders of the at least one lateral openings and remove~~[[s]]~~ them along the transport surface, and wherein the lateral opening of the working head forms an L-shaped slot having a limb extending substantially in a longitudinal direction and a limb extending along a part of a circumference.

4. (Previously presented) The working head as claimed in claim 3, wherein a ratio of a width of the limb extending in the longitudinal direction to a width of the limb extending along the part of the circumference is from 1.0 to 1.3.

5. (Previously presented) The catheter as claimed in claim 1, wherein the distal part of the transport screw in the region of the working head is formed so as to be an exact fit in an external diameter relative to an internal diameter of a substantially cylindrical working head, so that the external diameter of the transport screw has only minimal diameter play relative to the internal diameter of an inner lateral surface of the working head.

6. (Previously presented) The catheter as claimed in claim 1, wherein edges on an outside of the transport screw are formed so as to be sharp in a region of the lateral opening of the working head.

7. (Previously presented) The catheter as claimed in claim 1, wherein the working head tapers towards the distal end.

8. (Previously presented) The catheter as claimed in claim 1, wherein edges of the lateral opening are formed so as to be sharp at least in sections in a region of an inner lateral surface of the working head.

9. (Previously presented) The catheter as claimed in claim 1, wherein edges of the lateral opening are formed so as to be rounded at least in sections in a region of an outer lateral surface of the working head.
10. (Previously presented) The catheter as claimed in claim 1, wherein the lateral opening is in the form of a slot.
11. (Previously presented) The catheter as claimed in claim 10, wherein the slot runs at least partially in an axial direction of the working head.
12. (Previously presented) The catheter as claimed in claim 10, wherein the slot is formed, relative to a longitudinal axis of the working head, at least partly along a helix.
13. (Previously presented) The catheter as claimed in claim 11, wherein a width of the slot decreases toward a proximal end of the working head.
14. (Previously presented) The catheter as claimed in claim 10, wherein the slot is formed in an L-shape.
15. (Previously presented) The catheter as claimed in claim 1, wherein, in a distal end region of the working head, at least one groove-like recess, starting from the distal end and opening into the lateral opening, is arranged on an outer lateral surface.
16. (Previously presented) The catheter as claimed in claim 15, wherein a depth of the groove-like recess increases toward a proximal end of the working head.
17. (Previously presented) The catheter as claimed in claim 15, wherein a width of the groove-like recess is greater than a chord of an internal diameter of the working head in a region of a groove base.
18. (Previously presented) The catheter as claimed in claim 1, wherein the working head is connected to the tube axially in a manner resistant to tension and pressure.
19. (Previously presented) The catheter as claimed in claim 1, wherein the tube has a reinforcement in one or more sections.

20. (Previously presented) The catheter as claimed in claim 19, wherein the reinforcement is in the form of a metallic helix.
21. (Previously presented) The catheter as claimed in claim 19, wherein the reinforcement is arranged on an inside of the tube.
22. (Canceled)
23. (Previously presented) The catheter as claimed in claim 1, wherein the working head and/or the transport screw comprise metal, including stainless steel.
24. (Previously presented) The catheter as claimed in claim 1, wherein the working head comprises sintered ceramic, metal ceramic or a highly resistant layer, for protection from wear.
25. (Canceled)